

1. An authentication-data issuing system based on unique time, said authentication-data issuing system including a plurality of computers connected with each other via communication lines with one of said computers set to function as a master computer, said master computer comprising:

a unique time generating device including time
10 keeping means for sequentially outputting unit time
values at predetermined intervals over a preset time-
measuring period that begins at a given start point on a
selected date and terminates at a given future end point
and accumulating means for sequentially accumulating said
15 unit time values output by said time keeping means so as
to constantly measure a changing elapsed time within the
time-measuring period;

transmitter means for, during communication between said master computer and another of the computers
20 subservient to said master computer, transmitting, from
said master computer to the subservient computer, authentication data based on an elapsed time measurement, corresponding to a given time point, indicated by said unique time generating device; and

25 register means for receiving and registering an
issuance history of unique authentication data created
and issued by said subservient computer imparting

additional data, unique to said subservient computer, to the authentication data transmitted by said master computer.

5 2. An authentication-data issuing system based on
unique time, said authentication-data issuing system
including a plurality of computers connected with each
other via communication lines with one of said computers
set to function as a master computer, said master
10 computer including a unique time generating device
including time keeping means for sequentially outputting
unit time values at predetermined intervals over a preset
time-measuring period that begins at a given start point
on a selected date and terminates at a given future end
15 point and accumulating means for sequentially
accumulating said unit time values output by said time
keeping means so as to constantly measure a changing
elapsed time within the time-measuring period,

each of the computers subservient to said master
20 computer comprising:

receiver means for, during communication with said
master computer, receiving authentication data based on
an elapsed time measurement, corresponding to a given
time point, indicated by said unique time generating
25 device of said master computer;

issuer means for creating and issuing unique
authentication data by imparting additional data, unique

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transmitter means for transmitting, to said master
5 computer, an issuance history of the unique
authentication data created and issued by said issuer
means.

3. An authentication-data issuing system as recited in claim 2 wherein said issuer means in each of the subservient computers includes imparting means for imparting the additional data, unique to said subservient computer, to the received authentication data, and said imparting means includes a unique time generating device that includes time keeping means for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period, and

wherein said unique time generating device in said imparting means indicates elapsed time measurements over the time-measuring period that is different from the time-measuring periods of the unique time generating

devices provided in said master computer and other subservient computers and creates and issues unique authentication data peculiar to said subservient computer.

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4. An authentication-data issuing system based on unique time, said authentication-data issuing system including a plurality of computers connected with each other via communication lines with one of said computers set to function as a master computer, each of the
10 computers subservient to said master computer comprising:

a unique time generating device including time keeping means for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period unique to said computer that begins at
15 a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a
20 changing elapsed time within the time-measuring period;

issuer means for creating and issuing unique authentication data, peculiar to said subservient computer, on the basis of an elapsed time measurement indicated by said unique time generating device; and

25 transmitter means for transmitting, to said master computer, an issuance history of the unique authentication data created and issued by said issuer

means.

5. An authentication-data issuing system based on unique time, said authentication-data issuing system including a plurality of computers connected with each other via communication lines with one of said computers set to function as a master computer, each of the computers subservient to said master computer comprising a unique time generating device including time keeping means for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period unique to said computer that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period,

said master computer, exercising general control of the subservient computers, including register means for receiving and registering an issuance history of data created and issued by each of said subservient computers on the basis of an elapsed time measurement indicated by said unique time generating device of said subservient computer.

6. An authentication-data issuing system as recited in claim 3 ~~or 4~~ wherein said master computer functions as

an original supplier of unique time to said subservient computers so that said unique time generating devices of said subservient computers are activated to indicate elapsed time measurements within their respective preset
5 time-measuring periods different from each other.

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7. An authentication-data issuing system as recited in claim 3 ¹ ~~or 4~~ wherein said master computer functions as an original supplier of unique time to said subservient
10 computers so that said unique time generating devices of said subservient computers are activated to indicate elapsed time measurements within their respective preset time-measuring periods different from each other, and each of the computers that are immediately subservient to
15 said master computer is a second-level computer that functions as a secondary supplier of unique time data to third-level computers subservient to said second-level computer so that the unique time generating devices of said third-level computers are activated to indicate
20 ~~elapsed time measurements within their respective preset~~ time-measuring periods different from each other.

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8. An authentication-data issuing system as recited in ^{claim 1} ~~any one of the preceding claims~~ wherein said master
25 computer includes storage means for storing data on said unique time generating device of each of the subservient computers which include data indicative of the time-

measuring period of said unique time generating device,
or

data on attributes of said unique time generating
devices of said master computer and each of said
5 subservient computers, or

unique additional data to be imparted, by each of
said subservient computers, to the authentication data
received from said master computer.

10 9. An authentication-data issuing system as recited in
claim 1
1 ~~any one of claims 1 to 7~~ wherein the unique
authentication data created and issued by each of said
subservient computers is transmitted to and used by one
or more other subservient computers under control of said
15 master computer every time a transaction involving use of
the unique authentication data is performed.

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20 10. An authentication-data issuing system as recited
claim 1
1 ~~in any one of claims 1 to 7~~ wherein the unique
authentication data created and issued by each of said
subservient computers includes various information to be
transmitted to one or more other subservient computers
under control of said master computer, said various
information including any of information representative
25 of nature of a transaction, merchandise, settlement of
account and credit standing.

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a 11. A recording media having stored thereon unique authentication data created by any one of said subservient computers as recited in ^{claim 1} ~~any one of claims 1 to 7~~, said recording media being issued by said
5 subservient computer.

12. A recording media as recited in claim 11 which comprises a floppy disk, IC card, magnetic card or writable CD-ROM.

10 13. A recording media as recited in claim 11 where the unique authentication data stored thereon includes any of monetary information, information on credit loan, money information indicative of a current balance of
15 deposit or saving in a particular account, and information indicative of permission or refusal of use of an amusement part, game house, recreational facility, a railroad, bus, ship, airplane, telephone, facsimile, automatic vending machine or the like.

20 a sub b 14. An authentication-data issuing system as recited in ^{claim 1} ~~any one of claims 1 to 7~~ wherein said mater computer is a host computer of a central bank exercising general control of banking operations and said subservient
25 computers are computers of banking agencies such as city, local and credit banks under control of the host computer of the central bank, and wherein a transaction,

such as money supply, settlement, loaning, money changing
or payment into account, between any one of the banking
agencies and a customer is performed on the basis of
unique authentication data created and issued for each
5 transaction.

15. An authentication-data issuing system as recited
in ^{claim 1} ~~any one of claims 1 to 7~~ wherein said master computer
is a host computer of a main office of a banking agency
10 exercising general control of a plurality of branches,
local offices and the like of the banking agency and
said subservient computers are computers installed in the
main office, branches and local offices of the banking
agency, and wherein a transaction, such as money supply,
15 settlement, loaning, money changing or payment into
account, between any one of the subservient computers and
a customer is performed on the basis of unique
authentication data created and issued for each
transaction.

20 16. An authentication-data issuing system as recited
in ^{claim 1} ~~any one of claims 1 to 7~~ wherein said mater computer
is a host computer of a main office exercising general
control of an organization such as a company or
25 corporation and said subservient computers are computers
for use at various stations or by constituent members of
the organization, and wherein an operation to be effected

by each of the stations or constituent members is performed on the basis of unique authentication data created and issued by the corresponding subservient computer for each operation.

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17. An authentication-data issuing system as recited in any one of claims 1 to 7 wherein said mater computer is a host computer of an administrative organ exercising general control of administrative affairs and said

10 subservient computers are computers for use at various stations or by constituent members of the administrative organ, and wherein an operation to be effected by each of the stations or constituent members is performed on the basis of unique authentication data created and
15 issued by the corresponding subservient computer for each operation.

18. A recording media as recited in claim 11 wherein said mater computer is a host computer of a

20 transportation company exercising general control of operations for issuing various tickets, such as an ordinary passenger ticket, railroad and ship tickets, coupon ticket, commuter pass and airline ticket and said subservient computers are computers contained in vending
25 machines installed in a station, airlines, shipping company, tourist bureau, convenience store and the like, said recording media being employed as the thicket issued

by any one of the vending machines and having stored thereon unique authentication data that is created by said subservient computer of the vending machine every time the ticket is used.

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19. A recording media as recited in claim 11 wherein said mater computer is a host computer exercising general control of operations for issuing various prepaid cards for using a railroad, ship, airplane, pachinko game machine, telephone, amusement park and the like and said subservient computers are computers contained in vending machines for issuing the prepaid cards, said recording media being employed as the prepaid card issued by any one of the vending machines and having stored thereon unique authentication data that is created by said subservient computer of the vending machine every time the ticket is used.

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20. A recording media as recited in claim 11 wherein said mater computer is a host compute of a central bank exercising general control of operations for issuing electronic money and said subservient computers are computers contained in money issuing machines for issuing electronic money to users, said recording media being employed as the electronic money issued by any one of the money issuing machines and having stored thereon unique authentication data that is created by said

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subservient computer of the money issuing machine every time the electronic money is used.

21. A recording media as recited in claim 11 wherein
5 said mater computer is a host compute of an
administrative organ exercising general control of public
services to be provided to individual residents and said
subservient computers are computers contained in card
10 issuing machines for issuing personalized ID cards that
are to be used by the individual residents to get the
public services, said recording media being employed as
the ID card issued by any one of the card issuing
machines and having stored thereon unique authentication
data that is created by said subservient computer of the
15 vending machine every time the ID card is used.

22. A recording media as recited in claim 11 wherein
said mater computer is a host compute exercising general
control of operations of a banking agency, credit

20 ~~company, securities company, insurance company, loan~~
company and trust company issuing cards such as a cash
card, loan card and credit card and said subservient
computers are computers contained in card issuing
machines for issuing cards to individual customers, and
25 which is employed as said card issued by any one of the
card issuing machines and has stored thereon in magnetic
form unique authentication data that is created by said

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subservient computer of the money issuing machine every time the card is used.

23. An authentication-data verifying system including a plurality of computers connected with each other via communication lines with one of said computers set to function as a master computer, each of the computers subservient to said master computer comprising:

reading means for reading unique authentication data issued by any one of the subservient computers on the basis of information received from another of the subservient computers, or reading unique authentication data issued by any one of the subservient computers and recorded on a recording media;

transmitter means for transmitting the unique authentication data read by said reading means to said master computer for subsequent collation thereby; and

receiver means for receiving from said master computer a result of collation between an issuance history of the unique authentication data by each of said subservient computers registered in said master computer and the unique authentication data transmitted by said transmitter means.

24. An authentication-data verifying system including a plurality of computers connected with each other via communication lines with one of said computers set to

function as a master computer, said master computer comprising:

receiver means for receiving unique authentication data transmitted by transmitter means of any one of the computers subservient to said master computer, said
5 unique authentication data being issued by the subservient computer and read by reading means of the subservient computer; and

collator means for collating between the unique
10 authentication data received by said receiver means and an issuance history of the unique authentication data by each of said subservient computers that is registered in said master computer; and

transmitter means for transmitting a result of
15 collation by said collator means to receiver means of the subservient computer.

25. An authentication-data verifying system as recited in claim 23 wherein each of said subservient computers
20 includes rejecting means which when a result of the collation by said collator means of said master computer indicates that the unique authentication data read by said reading means is not present in the issuance history, rejects subsequent access between said
25 subservient computer and another of said subservient computers or rejects use, in said subservient computer, of a recording media having stored thereon the unique

authentication data.

26. An authentication-data verifying system as recited
in claim 23 wherein each of said subservient computers
5 includes authorizing means which when a result of the
collation by said collator means of said master computer
indicates that the unique authentication data read by
said reading means is present in the issuance history,
authorizes subsequent access between said subservient
10 computer and another of said subservient computers or
authorizes use, in said subservient computer, of a
recording media having stored thereon the unique
authentication data.

27. An authentication-data issuing system based on
unique time, said authentication-data issuing system
including a plurality of computers connected with each
other via communication lines with one of said computers
set to function as a master computer, each of the
15 computers subservient to said master computer being
accessed by another of the subservient computers on the
basis of unique authentication data authorized by said
authorizing means recited in claim 26 or being connected
with a recording media, having stored thereon the unique
20 authentication data whose use is permitted by said
authorizing means recited in claim 26,

said master computer comprising a unique time

generating device including time keeping means provided in said master computer for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period,

each of said subservient computers comprising: receiver means for, during communication with said master computer, receiving authentication data based on an elapsed time measurement, corresponding to a given time point, indicated by said unique time generating device;

issuer means for creating and issuing unique authentication data by imparting additional data, unique to said subservient computer, to the authentication data received via said receiver means; and

transmitter means for transmitting, to said master computer, the unique authentication data created and issued by said issuer means.

28. An authentication-data issuing system as recited in claim 27 wherein said issuer means in each of said subservient computers includes imparting means for imparting, to the received authentication data, the additional data unique to said subservient computer, and

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said imparting means includes a unique time generating device that includes time keeping means for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period, and

wherein said unique time generating device in said imparting means indicates elapsed time measurements over a time-measuring period that is different from time-measuring periods of the unique time generating devices provided in said master computer and other subservient computers and creates and issues unique authentication data peculiar to said subservient computer.

29. An authentication-data issuing system based on unique time, said authentication-data issuing system including a plurality of computers connected with each other via communication lines with one of said computers set to function as a master computer, each of the computers subservient to said master computer being accessed by another of the subservient computers on the basis of unique authentication data authorized by said authorizing means recited in claim 26 or being connected

with a recording media, having stored thereon unique authentication data whose use is authorized by said authorizing means recited in claim 26,

each of said subservient computers comprising:

5 a unique time generating device for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for
10 sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period;

issuer means for creating and issuing unique-authentication-data updating data, corresponding to the
15 authorized unique authentication data, on the basis of an elapsed time measurement indicated by said unique time generating device; and

transmitter means for transmitting, to said master computer, the unique-authentication-data updating created
20 and issued by said issuer means.

30. An authentication-data issuing system based on unique time, said authentication-data issuing system including a plurality of computers connected with each
25 other via communication lines with one of said computers set to function as a master computer, each of the computers subservient to said master computer being

accessed by another of the subservient computers on the basis of unique authentication data authorized by said authorizing means recited in claim 26 or being connected with a recording media, having stored thereon unique authentication data whose use is authorized by said authorizing means recited in claim 26,

said master computer comprising:

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a unique time generating device including time keeping means for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period;

transmitter means for transmitting to, any one of the subservient computers, authentication data based on an elapsed time measurement, corresponding to a given time point, indicated by said unique time generating device; and

renewal means for receiving unique-authentication-data updating data that is created and issued by the subservient computer imparting additional data, unique to the subservient computer, to the authentication data from said transmitter means of said master computer, and altering the unique authentication data on the basis of

the received unique-authentication-data updating data to thereby update an issuance history of the unique authentication data by said subservient computer that is registered in said master computer.

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31. An authentication-data issuing system based on unique time, said authentication-data issuing system including a plurality of computers connected with each other via communication lines with one of said computers set to function as a master computer, each of the computers subservient to said master computer being accessed by another of the subservient computers on the basis of unique authentication data permitted by said authorizing means recited in claim 26 or being connected with a recording media, having stored thereon the unique authentication data whose use is permitted by said authorizing means recited in claim 26,

said subservient computer including a unique time generating device which includes time keeping means for sequentially outputting unit time values at predetermined intervals over a preset time-measuring period that begins at a given start point on a selected date and terminates at a given future end point and accumulating means for sequentially accumulating said unit time values output by said time keeping means so as to constantly measure a changing elapsed time within the time-measuring period,

said master computer including renewal means for

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receiving unique-authentication-data updating data that is created and issued by the subservient computer in correspondence with the authorized unique authentication data and altering the unique authentication data on the basis of the received unique-authentication-data updating data to thereby update an issuance history of the unique authentication data by said subservient computer that is registered in said master computer.

10 32. An authentication-data issuing system as recited in claim 30 ~~or 31~~ wherein said subservient computer includes renewal means, similar to said renewal means of said master computer, for altering the unique authentication data used for gaining authorization to access to another of the computers or to make use of the recording media, on the basis of the unique-authentication-data updating data.

20 33. An authentication-data issuing system as recited in claim 32 wherein said renewal means of said subservient computer receives data relating to the issuance history updated by said renewal means of said master computer, in such a way that said subservient computer updates the unique authentication data on the basis of the received data relating to the issuance history.

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34. An authentication-data issuing system as recited in claim 32 wherein the unique authentication data updated by said renewal means is stored in memory of the subservient computer, having accessed using last-issued
5 unique authentication data, so that the updated unique authentication data is used for next access to another of the subservient computers.

35. An authentication-data issuing system as recited
10 in claim 32 wherein said renewal means alters last-issued unique authentication data, stored on the recording media used in said subservient computer, on the basis of the created and issued unique-authentication-data updating data.

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36. An authentication-data issuing system as recited in any one of claims 14 to 17 wherein the unique authentication data created and issued by said subservient computer contains the unique authentication
20 ~~data updated by said renewal means recited in claim 34.~~

37. A recording media having stored thereon unique authentication data updated by the unique-authentication-data updating data created and issued in claim 35.

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38. An authentication-data issuing system as recited in claim 37 wherein the recording media having stored

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thereon updated unique authentication data is the ticket recited in claim 18, prepaid card recited in claim 19, electronic money recited in claim 20, ID card recited in claim 21 or card recited in claim 22, and wherein the

5 subservient computer that stores the updated unique authentication data on said recording media is contained in or attached to an automatic ticket checker or a card reader/writer for a prepaid card, ID card or electronic money.

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39. An authentication-data issuing system based on unique time or recording media issued by said authentication-data issuing system as recited in claim 38 wherein the recording media used in said subservient

15 computer is a ticket, electronic money, prepaid card or other card, and wherein information indicative of a current balance calculated by subtracting, from a money amount stored on said recording media, a money amount spent at the time of creation of the updated unique

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authentication data.

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